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# PENNSYLVANIA GEOLOGICAL PUBLICATIONS



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COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL RESOURCES  
OFFICE OF RESOURCES MANAGEMENT

BUREAU OF  
TOPOGRAPHIC AND GEOLOGIC SURVEY

Arthur A. Socolow, *State Geologist*

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DOCUMENTS SECTION

*Cover illustration by Edith Socolow*

# **PUBLICATIONS ON THE GEOLOGY OF PENNSYLVANIA**

**ISSUED BY**

**Bureau of Topographic and Geologic Survey**

**and also**

**United States Geological Survey**

**United States Bureau of Mines**

**1984**

To find the numbers of the reports covering the topic in which you are interested, refer to the index listing of reports in the back of this pamphlet. Publications are indexed by county or by commodity. Before ordering a publication, refer to the list of publications to find the title, description, and price of the item in which you are interested, and whether or not the publication is in print. For cost information, refer to the Price List insert.

In ordering publications or maps, please follow the instructions on pages 3 and 4 to avoid needless delay in processing your order.

Should you desire additional information, the Topographic and Geologic Survey will be glad to assist you in any manner.

Very truly yours,

A handwritten signature in dark ink, reading "Arthur A. Socolow". The signature is fluid and cursive, with the first name "Arthur" and last name "Socolow" clearly legible.

**Arthur A. Socolow**  
State Geologist

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## HOW TO OBTAIN TOPOGRAPHIC MAPS OF PENNSYLVANIA

Topographic maps of Pennsylvania are prepared by the United States Geological Survey in cooperation with the Bureau of Topographic and Geologic Survey. Persons wishing to know the names and scales of topographic maps that are available for Pennsylvania may obtain an **Index to Topographic Mapping** in Pennsylvania free on request from either:

Pennsylvania Geological Survey  
Department of  
Environmental Resources      or  
P. O. Box 2357  
Harrisburg, PA 17120

Eastern Distribution Branch  
U.S. Geological Survey  
1200 South Eads Street  
Arlington, VA 22202

Topographic maps may be purchased from the U.S. Geological Survey at the address listed in the right-hand column above. On map orders, customers should state the name of the map as well as the type of map desired (for example, "Pottstown, PA, 7½-minute") and are urged to use order blanks available with the Index to Topographic Mapping in Pennsylvania mentioned above. Orders must be accompanied by check or money order payable to U.S. Geological Survey. Do not send cash or postage stamps.

At slightly higher costs, maps may be purchased across the counter from the commercial dealers listed in the Index to Topographic Mapping in Pennsylvania.

<p><b>IMPORTANT! READ INSTRUCTIONS BELOW BEFORE ORDERING</b></p>
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## HOW TO ORDER PUBLICATIONS

### PENNSYLVANIA GEOLOGICAL SURVEY

Publications of the Pennsylvania Geological Survey are obtained from two places. If the publication is **free** or an **open-file** report, write to:

Pennsylvania Geological Survey  
Department of Environmental Resources  
P. O. Box 2357  
Harrisburg, PA 17120

**If there is a charge** for the publication, it can be obtained only from:

Department of General Services  
State Book Store  
P. O. Box 1365  
Harrisburg, PA 17105

Use order form inside back cover.

Enclose the cost of the publication with the order plus **6% state sales tax** if the **publication is to be mailed to a Pennsylvania address**. The sales tax is computed as follows: 10c or less, no tax; 11c to 17c, 1c; 18c to 34c, 2c; 35c to 50c, 3c; 51c to 67c, 4c; 68c to 84c, 5c; 85c to \$1.10, 6c. For tax over \$1.10 add 6c for each dollar plus an amount as indicated by the preceding schedule.

Send check or money order payable to **Commonwealth of Pennsylvania**. Stamps will not be accepted as payment.

## U.S. GEOLOGICAL SURVEY

Requests for bulletins, circulars, professional papers, and water-supply papers should be sent to the address below with payment in the form of a check or money order payable to the **U.S. Geological Survey**. The series designation and number (for example, Professional Paper 744) and complete title should be included with the request. Prices for these publications are not included in this issue. Call 703-756-6141 or write for current price information.

Eastern Distribution Branch  
Text Products Section  
U.S. Geological Survey  
604 South Pickett Street  
Alexandria, VA 22304

Requests for maps, charts, atlases, and map indexes should be sent to the address below with payment in the form of a check or money order payable to the **U.S. Geological Survey**. The map name or series designation and number, such as "Tamaqua 7½-minute quadrangle" or "GQ-1133," should be included with the request. Prices for these publications are not included in this issue. Call 703-557-2751 or write for current price information.

Eastern Distribution Branch  
U.S. Geological Survey  
1200 South Eads Street  
Arlington, VA 22202

## U.S. BUREAU OF MINES

If the publication is free, write to:

Publications Distribution Branch  
Bureau of Mines  
U.S. Department of Interior  
4800 Forbes Avenue  
Pittsburgh, PA 15213

If there is a charge for the publication, send requests to the address below. Orders must be accompanied by check or money order payable to **Superintendent of Documents**. Prices for these publications are not included in this issue. Call 202-783-3238 or write for current price information.

Superintendent of Documents  
U.S. Government Printing Office  
Washington, DC 20402

## THE GEOLOGICAL SURVEYS OF PENNSYLVANIA

There have been four geological surveys of Pennsylvania and four resulting series of publications:

First Survey, 1836-1842: Publications—6 annual reports, 2 quarto-volumes, and a state geologic map.

Second Survey, 1874-1889: Publications—81 volumes, 35 atlases, and a grand atlas.

Third (Commission) Survey, 1899-1914: Publications—6 biennial reports and 12 economic reports listed in this pamphlet.

Fourth Survey, 1919- : Publications listed in this pamphlet (fourth series).

All reports of the first three geological surveys and some of the reports of the present (fourth) survey are out of print.



## SOURCES OF OUT-OF-PRINT REPORTS

Many reports appearing in this list of publications are marked with an asterisk (\*), indicating that they are out of print and no longer available for distribution. Out-of-print reports are available for study in many libraries throughout the state, particularly those in larger cities and at colleges.

The library of the Pennsylvania Geological Survey in Harrisburg is open for public use and contains all previous Pennsylvania Survey reports, as well as most of the U.S. Geological Survey, U.S. Bureau of Mines, and other governmental and institutional reports.

## BIBLIOGRAPHIES OF PENNSYLVANIA GEOLOGY

For a complete annotated listing of all publications dealing with Pennsylvania geology, including journal articles and nongovernmental publications, please refer to the following General Geology Reports published by the Pennsylvania Survey:

- G 34 **Annotated bibliography of Pennsylvania geology to 1949**,  
by H. R. Cramer
- G 42 **Annotated bibliography of Pennsylvania geology—supplement to 1959**, by H. R. Cramer
- G 61 **Annotated bibliography of Pennsylvania geology—supplement to 1969**, by H. R. Cramer
- G 73 **Annotated bibliography of Pennsylvania geology—supplement to 1979** (in press)

## MAP SCALES

The list below shows map scales referred to on the following pages and indicates equivalent distances on the maps:

SCALE	EQUIVALENT DISTANCES ON MAPS
1:6,000	1 inch = 500 feet
1:12,000	1 inch = 1,000 feet
1:16,000	1 inch = 1,333 feet
1:24,000	1 inch = 2,000 feet
1:48,000	1 inch = 4,000 feet
1:50,000	1 inch = 4,167 feet
1:62,500	1 inch = approx. 1 mile
1:125,000	1 inch = approx. 2 miles
1:250,000	1 inch = approx. 4 miles
1:380,160	1 inch = approx. 6 miles
1:1,000,000	1 inch = approx. 16 miles
1:2,500,000	1 inch = approx. 39.5 miles

Other map scales cited in the List of Publications are followed by their equivalent distances.

# LIST OF PUBLICATIONS

## PENNSYLVANIA GEOLOGICAL SURVEY

### Fourth Series

*Order free publications from the Pennsylvania Geological Survey, Department of Environmental Resources, P.O. Box 2357, Harrisburg, PA 17120, and priced publications from the Department of General Services, State Book Store, P.O. Box 1365, Harrisburg, PA 17105.*

**ATLAS SERIES** Map scale 1:24,000 unless otherwise indicated. Quadrangle names refer to 7½-minute series unless otherwise indicated.

- |       |   |   |
|-------|---|---|
| A 5   | <b>New Castle 15' quadrangle</b> (Bessemer, New Castle South, New Galilee, and Beaver Falls 7½' quadrangles), Lawrence and Beaver Counties, F. W. DeWolf. 1929. 238 p., 18 pls., bedrock geol. map, surficial geol. map, econ. geol. map, scale 1:62,500 . . . . .  | * |
| A 27  | <b>Pittsburgh 15' quadrangle</b> (Pittsburgh East, Braddock, Glassport, and McKeesport 7½' quadrangles), Allegheny and Westmoreland Counties, M. E. Johnson. 1928; 3rd printing, 1974. 236 p., 33 pls., geol. map, min. resource map, scale 1:62,500 . . . . .  | † |
| A 33a | <b>Oil City quadrangle</b> , Venango County, A. N. Ward, Jr., and others. 1979. Geol. map and text on 1 pl. . . . .   | † |
| A 36  | <b>Freeport 15' quadrangle</b> (Freeport, Leechburg, New Kensington East, and Vandergrift 7½' quadrangles), Armstrong, Westmoreland, Allegheny, and Butler Counties, H. H. Hughes. 1933. 272 p., 9 pls., geol. map, scale 1:62,500 . . . . .  | † |
| A 37  | <b>Greensburg 15' quadrangle</b> (Murrysville, Slickville, Irwin, and Greensburg 7½' quadrangles), Westmoreland and Allegheny Counties, M. E. Johnson. 1925; 3rd printing, 1974. 162 p., 13 pls., geol. map, econ. geol. map, scale 1:62,500 . . . . .  | † |
| A 48  | <b>Donegal 15' quadrangle</b> (Mammoth, Stahlstown, Donegal, and Seven Springs 7½' quadrangles), Westmoreland, Fayette, and Somerset Counties, M. N. Shaffner. 1963. 116 p., 4 pls., geol. map, coal reserve maps, scale 1:62,500 . . . . .   | † |
| A 54  | <b>Brookville 15' quadrangle</b> (Corsica, Brookville, Summerville, and Coolspring 7½' quadrangles), Jefferson and Clarion Counties, C. K. Graeber and R. M. Foose. 1942; 3rd printing, 1974. 136 p., 16 pls., geol. map, min. resource map, scale 1:62,500 . . . . .   | † |
| A 55  | <b>Smicksburg 15' quadrangle</b> (Dayton, Valier, Plumville, and Marion Center 7½' quadrangles), Jefferson, Indiana, and Armstrong Counties, M. N. Shaffner. 1946; 2nd printing, 1969. 252 p., 11 pls., geol. map, min. resource map, scale 1:62,500 . . . . .  | † |
| A 57  | <b>New Florence 15' quadrangle</b> (Bolivar, New Florence, Wilpen, and Rachelwood 7½' quadrangles), Indiana, Westmoreland, Cambria, and Somerset Counties, M. N. Shaffner. 1958. 165 p., 13 pls., geol. and min. resource map, scale 1:62,500; coal reserve maps, scale approx. 1:84,000 (¾ in.=approx. 1 mi) . . . . . | † |
| A 64  | <b>Hazen, Falls Creek, Reynoldsville, and DuBois quadrangles</b> , Jefferson and Clearfield Counties, A. D. Glover and W. A. Bragonier. 1978. 131 p., 16 pls., geol. map, scale 1:24,000; coal resource maps, scale 1:48,000 . . . . .  | † |
| A 65  | <b>Punxsutawney 15' quadrangle</b> (Punxsutawney, McGees Mills, Rochester Mills, and Burnside 7½' quadrangles), Jefferson, Indiana, and Clearfield Counties, G. H. Ashley. 1926; 2nd printing, 1969. 145 p., 6 pls., geol. map, min. resource map, scale 1:62,500 . . . . .   | † |

\* Out of print

† See price list



A 74ab	<b>Sabula and Penfield quadrangles</b> , Clearfield, Elk, and Jefferson Counties, T. M. Berg and A. D. Glover. 1976. 98 p., 10 pls., geol. map, scale 1:24,000; coal reserve map, foundation and excavation map, scale 1:48,000 . . . . .	†
A 74cd	<b>Penfield 15' quadrangle</b> (southern half; Luthersburg and Elliott Park 7½' quadrangles), Clearfield County, W. E. Edmunds and T. M. Berg. 1971; 2nd printing, 1973. 184 p., 22 pls., geol. map, scale 1:24,000; coal reserve maps, foundation and excavation map, scale 1:48,000 . .	†
A 75	<b>Curwensville 15' quadrangle</b> (Mahaffey, Curwensville, Westover, and Irvona 7½' quadrangles), Clearfield County, G. H. Ashley. 1940; 3rd printing, 1974. 140 p., 4 pls., geol. map, min. resource map, scale 1:62,500 . . . . .	†
A 84cd	<b>Clearfield 15' quadrangle</b> (southern half; Clearfield and Leontes Mills 7½' quadrangles), Clearfield County, A. D. Glover. 1970; 2nd printing, 1973. 139 p., 15 pls., geol. map, scale 1:24,000; coal reserve maps, foundation and excavation map, scale 1:48,000 . . . . .	†
A 85ab	<b>Houtzdale 15' quadrangle</b> (northern half; Glen Richey and Wallacetown 7½' quadrangles), Clearfield County, W. E. Edmunds. 1968; 2nd printing, 1973. 150 p., 15 pls., geol. map, scale 1:24,000; coal reserve maps, scale 1:48,000 . . . . .	†
A 85cd	<b>Ramey and Houtzdale quadrangles</b> , Clearfield and Centre Counties, G. B. Glass and others. 1977. 94 p., 10 pls., geol. map, scale 1:24,000; coal resource maps, foundation and excavation map, scale 1:48,000 .	†
A 95a	<b>Philipsburg quadrangle</b> , Clearfield and Centre Counties, G. B. Glass. 1972. 241 p., 20 pls., geol. map, scale 1:24,000; coal reserve maps, foundation and excavation map, scale 1:48,000 . . . . .	†
A 96	<b>Tyrone 15' quadrangle</b> (Tyrone, Franklinville, Spruce Creek, and Alexandria 7½' quadrangles), Blair, Huntingdon, and Centre Counties, Charles Butts and others. 1939. 118 p., 14 pls., geol. map, scale 1:62,500 . . . . .	*
A 109a	<b>McConnellsburg quadrangle</b> , Fulton and Franklin Counties, K. L. Pierce. 1966; 2nd printing, 1974. 111 p., 3 pls., bedrock geol. map, surficial geol. map . . . . .	†
A 119ab	<b>Northeastern Franklin County</b> , S. I. Root. 1971; 2nd printing, 1974. 104 p., 2 pls., geol. map . . . . .	†
A 119cd	<b>Southeastern Franklin County</b> , S. I. Root. 1968. 118 p., 1 pl., geol. map . . . . .	†
A 124a	<b>Lock Haven quadrangle</b> , Clinton and Lycoming Counties, A. R. Taylor. 1977. Geol. map and text on 1 pl. . . . .	†
A 126	<b>Mifflintown 15' quadrangle</b> (Alfarata, McClure, Mifflintown, and Mexico 7½' quadrangles), Juniata, Mifflin, and Snyder Counties, R. R. Conlin and D. M. Hoskins. 1962. 46 p., 2 pls., geol. map . . . .	†
A 127	<b>Loysville 15' quadrangle</b> (Spruce Hill, Ickesburg, Andersonburg, and Landisburg 7½' quadrangles), Perry, Juniata, and Cumberland Counties, J. T. Miller. 1961. 47 p., 2 pls., geol. map . . . . .	†
A 129a	<b>Caledonia Park quadrangle and adjoining areas</b> , Adams, Cumberland, and Franklin Counties, J. L. Fauth. 1968. 133 p., 7 pls., geol. map . .	†
A 129c	<b>Iron Springs quadrangle</b> , Adams and Franklin Counties, J. L. Fauth. 1978. 72 p., 1 pl., geol. map . . . . .	†
A 133cd	<b>Salladasburg and Cogan Station quadrangles</b> , Lycoming County, R. T. Faill and others. 1977. 44 p., 2 pls., bedrock geol. map, surficial geol. map . . . . .	†
A 134ab	<b>Linden and Williamsport quadrangles</b> , Lycoming County, R. T. Faill and others. 1977. 66 p., 2 pls., bedrock geol. map, surficial geol. map . . . . .	†

\*Out of print

†See price list

- A 136 **Millerstown 15' quadrangle** (Beaver Springs, Richfield, Millerstown, and Reward 7½' quadrangles), Perry, Juniata, and Snyder Counties, R. T. Faill and R. B. Wells. 1974. 276 p., 6 pls., geol. map, scale 1:24,000; tectonic and environ. map, scale 1:48,000 . . . . . †
- A 137ab **New Bloomfield 15' quadrangle** (northern half; Newport and Duncannon 7½' quadrangles), Perry County, J. L. Dyson. 1963. 63 p., 1 pl., geol. map . . . . . †
- A 137cd **New Bloomfield 15' quadrangle** (southern half; Shermans Dale and Wertzville 7½' quadrangles), Perry and Cumberland Counties, J. L. Dyson. 1967; 2nd printing, 1974. 86 p., 1 pl., geol. map . . . . . †
- A 138ab **Carlisle and Mechanicsburg quadrangles**, Cumberland County, S. I. Root. 1978. Geol. map and text on 1 pl. . . . . †
- A 143cd **Montoursville North and Huntersville quadrangles**, Lycoming County, R. B. Wells and M. F. Bucek. 1980. 68 p., 2 pls., bedrock geol. map, surficial geol. map . . . . . †
- A 144ab **Montoursville South and Muncy quadrangles and part of the Hughesville quadrangle**, Lycoming, Northumberland, and Montour Counties, R. T. Faill. 1979. 114 p., 2 pls., bedrock geol. map, surficial geol. map . . . . . †
- A 146 **Millersburg 15' quadrangle** (Dalmatia, Pillow, Millersburg, and Elizabethville 7½' quadrangles), Dauphin, Juniata, Northumberland, Perry, and Snyder Counties, D. M. Hoskins. 1976. 38 p., 2 pls., geol. map . . . . . †
- A 148ab **Harrisburg West area**, Cumberland and York Counties, S. I. Root. 1977. 106 p., 1 pl., geol. map . . . . . †
- A 157d **Palmyra quadrangle**, Lebanon and Dauphin Counties, A. R. Geyer. 1970. 46 p., 1 pl., geol. map . . . . . †
- A 164cd **Bloomsburg and Mifflinville quadrangles and part of the Catawissa quadrangle**, Columbia County, J. D. Inners. 1981. 152 p., 2 pls., bedrock geol. map, surficial geol. map . . . . . †
- A 167c **Lebanon quadrangle**, Lebanon County, A. R. Geyer and others. 1958. Geol. map, text on reverse . . . . . †
- A 167d **Richland quadrangle**, Lebanon and Lancaster Counties, Carlyle Gray and others. 1958. Geol. map, text on reverse . . . . . †
- A 168 **Lancaster 15' quadrangle** (Manheim, Lititz, Columbia East, and Lancaster 7½' quadrangles), Lancaster and Lebanon Counties, A. I. Jonas and G. W. Stose. 1930. 106 p., 23 pls., geol. map, scale 1:62,500 . . . . . †
- A 174c **Berwick quadrangle**, Luzerne and Columbia Counties, J. D. Inners. 1978. 34 p., 2 pls., bedrock geol. map, surficial geol. map . . . . . †
- A 177c **Womelsdorf quadrangle**, Lancaster, Lebanon, and Berks Counties, A. R. Geyer and others. 1963. 96 p., 1 pl., geol. map . . . . . †
- A 177d **Sinking Spring quadrangle**, Berks and Lancaster Counties, D. B. MacLachlan and others. 1975. 228 p., 3 pls., geol. map, scale 1:24,000; tectonic map, scale 1:63,360 (1 in. = 1 mi) . . . . . †
- A 178 **New Holland 15' quadrangle** (Ephrata, Terre Hill, Leola, and New Holland 7½' quadrangles), Lancaster County, A. I. Jonas and G. W. Stose. 1926; 2nd printing, 1969. 40 p., 7 pls., geol. map, scale 1:62,500 . . . . . †
- A 187ab **Temple and Fleetwood quadrangles**, Berks County, D. B. MacLachlan. 1979. 71 p., 2 pls., geol. map, scale 1:24,000; environ. geol. map and tectonic map, scale 1:48,000 . . . . . †
- A 187cd **Reading and Birdsboro quadrangles**, Berks County, D. B. MacLachlan. 1983. Geol. map and text on 1 pl. . . . . †

† See price list

A 194cd	<b>Hickory Run and Blakeslee quadrangles</b> , Carbon and Monroe Counties, W. D. Sevon. 1975. Bedrock geol. map with text on reverse, surficial geol. map . . . . .	†
A 195ab	<b>Christmans and Pohopoco Mountain quadrangles</b> , Carbon and Monroe Counties, W. D. Sevon. 1975. Bedrock geol. map with text on reverse, surficial geol. map . . . . .	†
A 195cd	<b>Lehighton and Palmerton quadrangles</b> , Carbon, Northampton, and Lehigh Counties, J. B. Epstein and others. 1974. 460 p., 4 pls., bedrock geol. map, surficial geol. map . . . . .	†
A 197	<b>Boyertown 15' quadrangle</b> (Manatawny, East Greenville, Boyertown, and Sassamansville 7½' quadrangles), Berks, Montgomery, and Lehigh Counties, T. V. Buckwalter. 1959. 15 p., 1 pl., geol. map . . . . .	†
A 204ab	<b>Tobyhanna and Buck Hill Falls quadrangles</b> , Monroe and Wayne Counties, W. D. Sevon. 1975. Bedrock geol. map with text on reverse, surficial geol. map . . . . .	†
A 204cd	<b>Pocono Pines and Mount Pocono quadrangles</b> , Monroe County, T. M. Berg and others. 1977. 66 p., 2 pls., bedrock geol. map, surficial geol. map . . . . .	†
A 205a	<b>Brodheadville quadrangle</b> , Monroe County, T. M. Berg. 1975. 60 p., 3 pls., bedrock geol. map, surficial geol. map . . . . .	†
A 206	<b>Allentown 15' quadrangle</b> (Catasauqua, Nazareth, Allentown East, and Hellertown 7½' quadrangles), Northampton, Lehigh, and Bucks Counties, B. L. Miller. 1925. 195 p., 15 pls., geol. and econ. geol. map, scale 1:62,500 . . . . .	*
A 214a	<b>Skytop quadrangle</b> , Monroe and Pike Counties, W. D. Sevon and T. M. Berg. 1978. 33 p., 1 pl., geol. map . . . . .	†
A 214c	<b>East Stroudsburg quadrangle</b> , Monroe County, M. F. Bucek. 1971; 2nd printing, 1974. 40 p., 1 pl., geol. map . . . . .	†
A 223	<b>Milford and Port Jervis 15' quadrangles</b> (Pennsylvania portion; Shohola, Pond Eddy, Edgemere, Milford, Port Jervis North, and Port Jervis South 7½' quadrangles), Pike County, F. W. Fletcher and D. L. Woodrow. 1970. 64 p., 2 pls., geol. map, scale 1:62,500 . . . . .	†

**COUNTY REPORTS** Map scale 1:62,500 unless otherwise stated. County reports are numbered alphabetically within the Commonwealth.

C 1	<b>Geology and mineral resources of Adams County</b> , G. W. Stose. 1932. 153 p., 26 pls., topo. map, scale 1:62,500; geol. map, scale 1:125,000 . . . . .	*
C 1	<b>Part 2, Mineral resources of Adams County</b> , G. W. Stose. 1925. 61 p., 11 pls. . . . .	*
C 1	<b>Part 3, Soil survey of Adams County</b> , A. L. Patrick and H. H. Bennett. 1924. 43 p., soils map . . . . .	*
C 9	<b>Geology and mineral resources of Bucks County</b> , Bradford Willard and others. 1959. 243 p., 24 pls., topo. map, geol. map . . . . .	*
C 26	<b>Geology and mineral resources of Fayette County</b> , W. O. Hickok IV and F. T. Moyer. 1940; 2nd printing, 1973. 530 p., 3 pls., topo. map, geol. map, coal map . . . . .	†
C 30	<b>Geology and mineral resources of Greene County</b> , R. W. Stone. 1932. 175 p., 3 pls., topo. map, geol. map, scale approx. 1:125,000 . . . . .	*
C 39	<b>Lehigh County</b> , B. L. Miller and others. 1941. 492 p., 39 pls., topo. and mine map, geol. map . . . . .	*

\* Out of print

† See price list

- |       |   |   |
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| C 48  | <b>Northampton County</b> , B. L. Miller and others. 1939; 3rd printing, 1973. 496 p., 29 pls., geol. map . . . . .   | † |
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# 7	<b>Geologic map of Pennsylvania (color)</b> . 1962; 7th printing, 1982. 9" x 12" . . . . .	free
# 8	<b>Topographic map of Bucks County</b> . 1959. Scale 1:62,500 . . . . .	*
# 9	<b>Subsurface structure of the plateau region of north-central and western Pennsylvania on top of the Oriskany Formation</b> , A. S. Cate. 1962. Scale 1:250,000 . . . . .	*
# 10	<b>Oil and gas fields map of Pennsylvania (color)</b> . 1963; 6th printing, 1982. 9" x 12" . . . . .	free
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# 15	<b>Limestone and dolomite distribution in Pennsylvania (color)</b> . 2nd ed., 1974. 8½" x 11" . . . . .	free
# 16	<b>Oil and gas well base map of the Corry, Tidioute, Titusville, and Youngsville 15' quadrangles (ozalid print, revised periodically)</b> . Scale 1:62,500 . . . . .	†
# 17	<b>Oil and gas well base map of the Kane, Kinzua, Sheffield, and Warren 15' quadrangles (ozalid print, revised periodically)</b> . Scale 1:62,500 . . . . .	†
# 18	<b>Oil and gas well base map of the Clarion, Foxburg, Oil City, and Tionesta 15' quadrangles (ozalid print, revised periodically)</b> . Scale 1:62,500 . . . . .	†

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# 19	Oil and gas well base map of the Brookville, DuBois, Hallton, and Marienville 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 20	Water yielding capability of rocks of Pennsylvania (color). 1970; 3rd printing, 1980. 9" x 12" . . . . .	free
# 21	Oil and gas well base map of the Zelienople, Butler, Sewickley, and New Kensington 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 22	Oil and gas well base map of the Kittanning, Rural Valley, Freeport, and Elders Ridge 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 23	Oil and gas well base map of the Smicksburg, Punxsutawney, Indiana, and Barnesboro 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 24	Oil and gas well base map of the Greensburg, Latrobe, Connellsville, and Donegal 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 25	Oil and gas well base map of the Carnegie, Pittsburgh, Amity, and Brownsville 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 26	Oil and gas well base map of the Stoneboro, Franklin, Mercer, and Hilliards 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 27	Industrial minerals produced in Pennsylvania. 1971; 2nd printing, 1973. 15" x 23" . . . . .	free
# 28	Oil and gas well base map of the Shenango, Neshannock, and Pennsylvania portion of Kinsman and Youngstown 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 29	Oil and gas well base map of the New Castle, Beaver, and Pennsylvania portion of Columbiana and Wellsville 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 30	Oil and gas well base map of the Burgettstown, Claysville, and Pennsylvania portion of Steubenville and Wheeling 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 31	Oil and gas well base map of the Rogersville 15' quadrangle and the Pennsylvania portion of the Mannington and Cameron 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 32	Oil and gas well base map of the Waynesburg, Masontown, and Pennsylvania portion of the Blacksville and Morgantown 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 33	Oil and gas well base map of the New Florence, Johnstown, Somerset, and Windber 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 34	Oil and gas well base map of the Uniontown, Confluence, and Pennsylvania portion of the Bruceton Mills and Accident 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 35	Oil and gas well base map of the Meyersdale, Berlin, and Pennsylvania portion of the Grantsville and Frostburg 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 36	Oil and gas well base map of the Coudersport, Genesee, Emporium, and Conrad 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 37	Oil and gas well base map of the Ebensburg, Hollidaysburg, Bedford, and Everett 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†

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# 38	Base map of Pennsylvania. 1962; 3rd printing, 1978. Scale 1:1,000,000, 15" x 23" . . . . .	free
# 39	Lehigh County topographic map. 1973. Scale 1:50,000 . . . . .	†
# 40	Oil and gas well base map of the Hyndman, Clearville, and Pennsylvania portion of the Flintstone and Paw Paw 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 41	Base map of Pennsylvania. 1975. Prepared from U.S. Geological Survey United States Series of Topographic Maps. Shows culture, drainage, and county and township boundaries. Scale 1:250,000; two 42" x 58" sheets . . . . .	†
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# 43	Greater Pittsburgh Region structure contour map, W. R. Wagner and others. 1975. Scale 1:125,000 . . . . .	†
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# 51	Oil and gas well base map of the Girard, Linesville, and Pennsylvania portion of the Conneaut and Andover 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 52	Oil and gas well base map of the Cambridge Springs, Union City, Meadville, and Townville 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 53	Oil and gas well base map of the Ridgway, Benezette, Penfield, and Clearfield 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 54	Oil and gas well base map of the Curwensville, Houtzdale, Patton, and Altoona 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 55	Oil and gas well base map of the Philipsburg, Bellefonte, Tyrone, and Allensville 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 56	Oil and gas well base map of the Driftwood, Renovo West, Karthaus, and Snow Shoe 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 57	Oil and gas well base map of the Renovo East, Waterville, Howard, and Lock Haven 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†
# 58	Oil and gas well base map of the Tioga, Troy, Blossburg, and Canton 15' quadrangles (ozalid print, revised periodically). Scale 1:62,500 . . . . .	†

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# 59	Glacial deposits of Pennsylvania (color). 1981. 9" x 12". . . . .	free
# 60	Oil and gas well base map of the (A) Trout Run, (B) Eagles Mere, (C) Meshoppen, and (D) Pittston 15' quadrangles (ozalid print, revised periodically). (Note: These quadrangles are not adjacent to each other.) Scale 1:62,500 . . . . .	†
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4	The resources of Pennsylvania in a nutshell, G. H. Ashley. 1931. 15 p. . . . .	*
5	Fifteen years, Sept. 1, 1919, to Sept. 1, 1934, G. H. Ashley. 1934. 8 p . . . . .	*
6	A quarter century of progress, G. H. Ashley. 1944. 10 p. . . . .	*

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## PROGRESS REPORTS

PR 1-105	Mimeographed series of reports, all out of print, many superseded. See G 1 for partial list (previously referred to as Bulletins) . . . . .	*
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PR 107	Gas in Tioga County, S. H. Cathcart and T. H. Myers. 1934. 42 p. . . . .	*
PR 108	Geologic structure in the plateaus region of northern Pennsylvania and its relation to the occurrence of gas in the Oriskany sand, S. H. Cathcart. 1934. 24 p. (replaced by PR 138) . . . . .	*
PR 109	The possibility of finding gas in Cameron County, S. H. Cathcart. 1934. 16 p. . . . .	*
PR 110	The possible occurrence of gas in the Oriskany sand of Elk County, S. H. Cathcart. 1934. 21 p. . . . .	*
PR 111	Possibility of finding gas in the Oriskany sand of McKean County, S. H. Cathcart. 1934. 13 p. . . . .	*
PR 112	The white clays of Pennsylvania, Henry Leighton. 1934. 19 p. (see M 17 and M 23) . . . . .	*
PR 113	Pennsylvania geology summarized, Bradford Willard. 1935. 4th ed., 1962, reprinted as ES 4 . . . . .	*
PR 114	Subsurface stratigraphy of northwestern Pennsylvania and a resume of gas and oil possibilities of deeper sands, C. R. Fettke. 1935. 23 p. . . . .	*
PR 115	Structure and stratigraphy of Fayette County (preliminary rept.), F. T. Moyer. 1937. 20 p., 1 map (see C 26) . . . . .	*
PR 116	Bradford oil field (preliminary rept.), C. R. Fettke. 1937. 17 p. (see M 21) . . . . .	*
PR 117	Supplementary record of "deep sand" wells in Pennsylvania, S. H. Cathcart. 1937. 27 p. . . . .	*
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PR 122	Geology of the oil and gas fields of the Hilliards quadrangle, R. E. Sherrill and L. S. Matteson. 1939; 2nd printing, 1984. 25 p., 4 maps, 238 well records . . . . .	†
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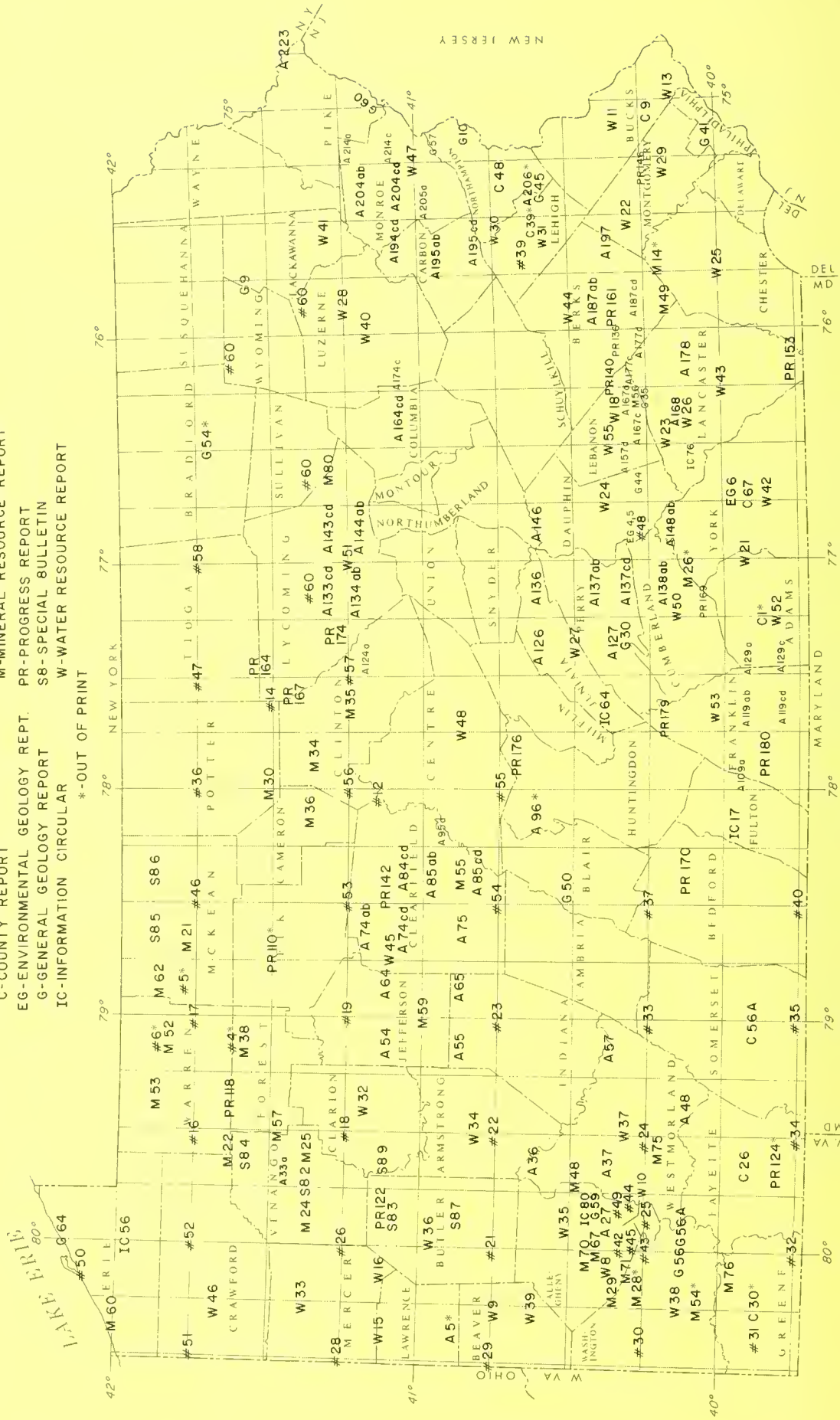
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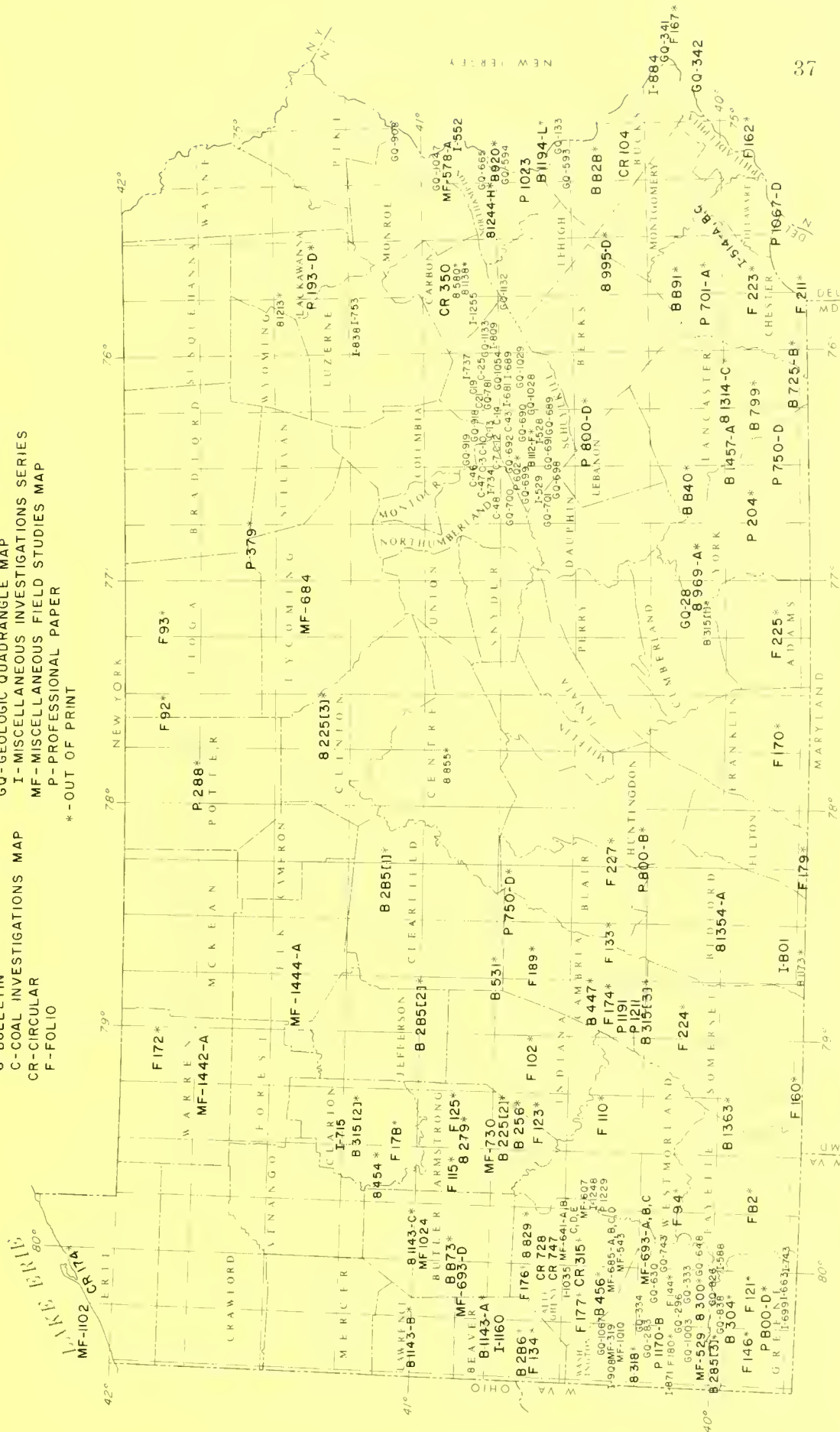
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| C- 25 | Geology of anthracite in the western part of the Delano quadrangle, Pa., J. A. Maxwell and H. E. Rothrock. 1955. 2 sheets . . . . .                    | ** |

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C- 43	<b>Geology of the northern half of the Minersville quadrangle and a part of the northern half of the Tremont quadrangle, Schuylkill County, Pa.,</b> G. H. Wood, Jr., and others. 1958. 2 sheets . . . . .	**
C- 46	<b>Geology of anthracite in the eastern part of the Shamokin quadrangle, Northumberland County, Pa.,</b> Walter Danilchik and others. 1962. 2 sheets including geologic map . . . . .	**
C- 47	<b>Geology of anthracite in the western part of the Shamokin quadrangle, Northumberland County, Pa.,</b> H. H. Arndt and others. 1963. 2 sheets including geologic map . . . . .	**
C- 48	<b>Geology of anthracite in the southern part of the Trevorton quadrangle, Northumberland County, Pa.,</b> H. H. Arndt and others. 1963. 2 sheets including geologic map . . . . .	**

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224	Somerset-Windber, G. B. Richardson. 1935. 14 p., 8 maps . . . . .	*
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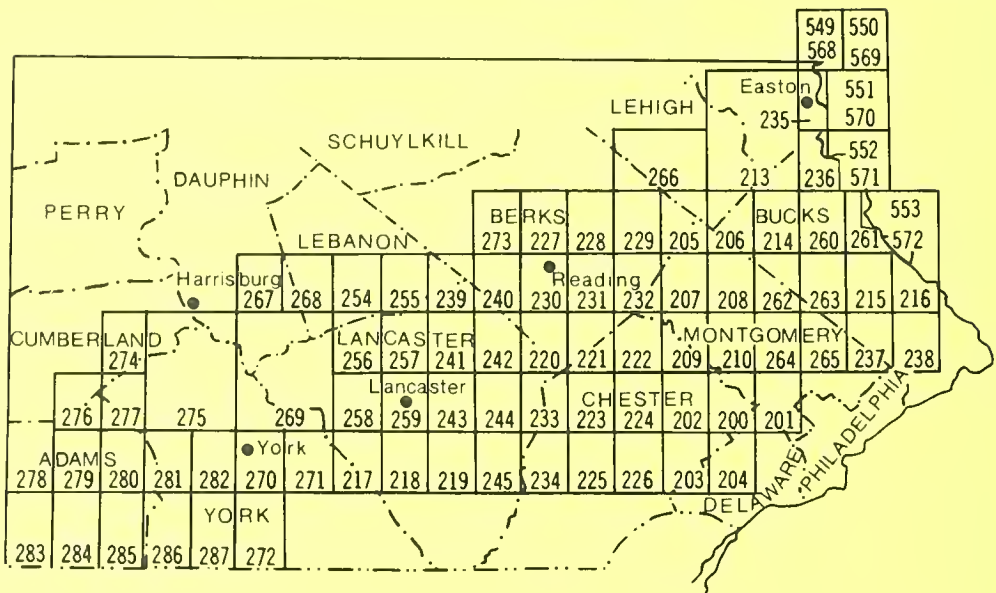
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HA-248	<b>Floods on Schuylkill River from Conshohocken to Philadelphia, Pa.</b> , A. T. Alter. 1967. Scale 1:16,000 . . . . .	**
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(Numbered blocks correspond to 15-minute quadrangle locations)



QUADRANGLE INDEX

The following list is to be used in conjunction with the index map on the previous page. The names of 15-minute quadrangles follow the numbered headings and the associated 7½-minute quadrangles follow the lettered headings. The index begins with the 15-minute quadrangle located in the upper left corner of the map.

1. Girard  
a. East Springfield  
b. Albion  
c. Beaver Center  
d. Conneautville

2. Linesville  
a. Linesville  
b. Harmonsburg  
c. Hartstown  
d. Conneaut Lake

3. Shenango  
a. Greenville West  
b. Greenville East  
c. Sharpsville  
d. Fredonia

4. Neshannock  
a. Sharon East  
b. Greenfield  
c. Edinburg  
d. New Castle North

5. New Castle  
a. Bessemer  
b. New Castle South  
c. New Galilee  
d. Beaver Falls

6. Beaver  
a. Midland  
b. Beaver  
c. Hookstown  
d. Aliquippa

7. Burgettstown  
a. Burgettstown  
b. Clinton  
c. Avella  
d. Midway
17. Carnegie  
a. Oakdale  
b. Pittsburgh West  
c. Canonsburg  
d. Bridgeville

18. Amity  
a. Washington East  
b. Hackett  
c. Amity  
d. Ellsworth

19. Waynesburg  
a. Waynesburg  
b. Mather  
c. Oak Forest  
d. Garards Fort

20. North East  
a. Harborscreek  
b. North East  
c. Hammett  
d. Wattsburg

21. Union City  
a. Waterford  
b. Union City  
c. Millers Station  
d. Lake Canadohta

22. Townville  
a. Townville  
b. Centerville  
c. Sugar Lake  
d. Dempseytown

23. Franklin  
a. Utica  
b. Franklin  
c. Polk  
d. Kennerdell
34. Foxburg  
a. Emlenton  
b. Knox  
c. Parker  
d. Rimersburg

35. Kittanning  
a. Chicora  
b. East Brady  
c. Worthington  
d. Kittanning

36. Freeport  
a. Freeport  
b. Leechburg  
c. New Kensington  
d. Vandergrift

37. Greensburg  
a. Murrysville  
b. Slickville  
c. Irwin  
d. Greensburg

38. Connellsville  
a. Smithton  
b. Mount Pleasant  
c. Dawson  
d. Connellsville

39. Uniontown  
a. Uniontown  
b. South Connellsville  
c. Brownfield  
d. Fort Necessity

41. Youngsville  
a. Lottsville  
b. Sugar Grove  
c. Pittsfield  
d. Youngsville
52. Sheffield  
a. Cherry Grove  
b. Sheffield  
c. Mayburg  
d. Lynch

53. Marienville  
a. Marienville West  
b. Marienville East  
c. Cooksburg  
d. Sigel

54. Brookville  
a. Corsica  
b. Brookville  
c. Summerville  
d. Coolspring

55. Smicksburg  
a. Dayton  
b. Valier  
c. Plumville  
d. Marion Center

56. Indiana  
a. Ernest  
b. Clymer  
c. Indiana  
d. Brush Valley

57. New Florence  
a. Bolivar  
b. New Florence  
c. Wilpen  
d. Rachelwood

58. Somerset  
a. Ligonier  
b. Boswell  
c. Bakersville  
d. Somerset

8.	Claysville	a. West Middletown b. Washington West c. Claysville d. Prosperity	24.	Hilliards	a. Barkeyville b. Eau Claire c. West Sunbury d. Hilliards	42.	Tidioute	a. Tidioute b. Cobham c. West Hickory d. Kellettville	59.	Meyersdale	a. Rockwood b. Murdock c. Markleton d. Meyersdale
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	b. New Baltimore		b. Mench		b. St. Thomas		b. Arendtsville
	c. Wittenberg		c. Chaneysville		c. Mercersburg		c. Iron Springs
	d. Fairhope		d. Amaranth		d. Williamson		d. Fairfield
71.	Bradford	91.	Coudersport	111.	Gaines	131.	Tioga
	a. Bradford		a. Shinglehouse		a. Harrison Valley		a. Tioga
	b. Derrick City		b. Oswayo		b. Potter Brook		b. Jackson Summit
	c. Lewis Run		c. Roulette		c. West Pike		c. Crooked Creek
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72.	Mt. Jewett	92.	Emporium	112.	Galeton	132.	Blossburg
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	b. Hazel Hurst		b. Austin		b. Marshlands		b. Blossburg
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	d. Glen Hazel		d. Wharton		d. Lee Fire Tower		d. Liberty
73.	Ridgway	93.	Driftwood	113.	Renovo East	133.	Trout Run
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	c. Brandy Camp		c. Driftwood		c. Renovo East		c. Salladasburg
	d. Kersey		d. Sinnemahoning		d. Glen Union		d. Cogan Station
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	b. Penfield		b. Pottersdale		b. Farrandsville		b. Williamsport
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	d. Elliott Park		d. Karthauss		d. Beech Creek		d. Williamsport SE
75.	Curwensville	95.	Philipsburg	115.	Centre Hall	135.	Mifflinburg
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	b. Curwensville		b. Black Moshannon		b. Madisonburg		b. Mifflinburg
	c. Westover		c. Sandy Ridge		c. Centre Hall		c. Beavertown
	d. Irvona		d. Port Matilda		d. Spring Mills		d. Middleburg
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	a. Hastings		a. Tyrone		a. Barville		a. Beaver Springs
	b. Coalport		b. Franklinville		b. Burnham		b. Richfield
	c. Carrolltown		c. Spruce Creek		c. Belleville		c. Millerstown
	d. Ashville		d. Alexandria		d. Lewistown		d. Reward
77.	Ebensburg	97.	Huntingdon	117.	East Waterford	137.	New Bloomfield
	a. Ebensburg		a. Williamsburg		a. McVeytown		a. Newport
	b. Gresson		b. Huntingdon		b. McCoyville		b. Duncannon
	c. Beaverdale		c. Entriaken		c. Blairs Mills		c. Shermans Dale
	d. Blue Knob		d. Cassville		d. Blain		d. Wertzville
78.	Bedford	98.	Broad Top	118.	Shippensburg	138.	Carlisle
	a. Ogetown		a. Saxton		a. Doyleburg		a. Carlisle
	b. Alum Bank		b. Saltito		b. Newburg		b. Mechanicsburg
	c. Schellsburg		c. Wells Tannery		c. Roxbury		c. Mount Holly Springs
	d. Bedford		d. Hustontown		d. Shippensburg		d. Dillsburg



79. Hyndman  
a. Buffalo Mills  
b. Rainsburg  
c. Hyndman  
d. Beans Cove
81. Smethport  
a. Eldred  
b. Bullis Mills  
c. Smethport  
d. Port Allegany
82. Crosby  
a. Crosby  
b. Norwich  
c. Wildwood Fire Tower
83. Benezetze  
a. Rathbun  
b. West Creek  
c. Weedville  
d. Dents Run
84. Clearfield  
a. Huntley  
b. The Knobs  
c. Clearfield
85. Houtzdale  
a. Glen Richey  
b. Wallacetown  
c. Ramey  
d. Houtzdale
86. Altoona  
a. Blandburg  
b. Tipton  
c. Altoona  
d. Bellwood
87. Hollidaysburg  
a. Hollidaysburg  
b. Frankstown  
c. Roaring Spring  
d. Martinsburg
88. Everett  
a. New Enterprise  
b. Hopewell  
c. Everett West  
d. Everett East
99. Needmore  
a. Breezewood  
b. Meadow Grounds  
c. Needmore  
d. Big Cove Tannery
101. Genesee  
a. Ellisburg  
b. Ulysses  
c. Sweden Valley  
d. Brookland
102. Conrad  
a. Ayers Hill  
b. Cherry Springs  
c. Conrad  
d. Short Run
103. Renovo West  
a. Hammersley Fork  
b. Tamarack  
c. Keating  
d. Renovo West
104. Snow Shoe  
a. Snow Shoe NW  
b. Snow Shoe NE  
c. Snow Shoe  
d. Snow Shoe SE
105. Bellefonte  
a. Bear Knob  
b. Bellefonte  
c. Julian  
d. State College
106. Allensville  
a. Pine Grove Mills  
b. McAleveys Fort  
c. Donation  
d. Allensville
107. Mt. Union  
a. Mount Union  
b. Newton Hamilton  
c. Butler Knob  
d. Aughwick
108. Orbisonia  
a. Orbisonia  
b. Shade Gap  
c. Burnt Cabins  
d. Fannettsburg
119. Chambersburg  
a. Chambersburg  
b. Scotland  
c. Greencastle  
d. Waynesboro
121. Elkland  
a. Knoxville  
b. Elkland  
c. Asaph  
d. Keeneyville
122. Antrim  
a. Tiadaghton  
b. Antrim  
c. Cedar Run  
d. Morris
123. Waterville  
a. Cammal  
b. English Center  
c. Jersey Mills  
d. Waterville
124. Lock Haven  
a. Lock Haven  
b. Jersey Shore  
c. Mill Hall  
d. Loganton
125. Millheim  
a. Millheim  
b. Woodward  
c. Coburn  
d. Weikert
126. Mifflintown  
a. Alfara  
b. McClure  
c. Mifflintown  
d. Mexico
127. Loysville  
a. Spruce Hill  
b. Ickesburg  
c. Andersonburg  
d. Landisburg
128. Newville  
a. Newville  
b. Plainfield  
c. Walnut Bottom  
d. Dickinson
139. Gettysburg  
a. Biglerville  
b. Hampton  
c. Gettysburg  
d. McSherrystown
141. Troy  
a. Millerton  
b. Gillett  
c. Roseville  
d. Troy
142. Canton  
a. Gleason  
b. Canton  
c. Raiston  
d. Grover
143. Warrensville  
a. Bodines  
b. Barbours  
c. Montoursville  
d. North
144. Huntersville  
a. Montoursville  
b. South  
c. Muncy  
d. Allenwood
145. Sunbury  
a. Lewisburg  
b. Northumberland  
c. Freeburg  
d. Sunbury
146. Millersburg  
a. Dalmatia  
b. Pillow  
c. Millersburg  
d. Elizabethville
147. Harrisburg  
a. Halifax  
b. Enders  
c. Harrisburg West  
d. Harrisburg East
148. New Cumberland  
a. Lemoyne  
b. Steelton  
c. Wellsboro  
d. Dover

- |      |                    |      |                   |      |                      |      |                     |
|------|--------------------|------|-------------------|------|----------------------|------|---------------------|
| 149. | Hanover            | 169. | McCalls Ferry     | 189. | Coatesville          | 209. | Chester             |
|      | a. Abbottstown     |      | a. Safe Harbor    |      | a. Parkesburg        |      | a. Media            |
|      | b. West York       |      | b. Conestoga      |      | b. Coatesville       |      | b. Lansdowne        |
|      | c. Hanover         |      | c. Airville       |      | c. Oxford            |      | c. Marcus Hook      |
|      | d. Seven Valleys   |      | d. Holtwood       |      | d. West Grove        |      | d. Bridgeport       |
| 151. | Sayre              | 171. | Le Raysville      | 191. | Susquehanna          | 211. | Long Eddy           |
|      | a. Bentley Creek   |      | a. Little Meadows |      | a. Great Bend        |      | c. Long Eddy        |
|      | b. Sayre           |      | b. Friendsville   |      | b. Susquehanna       |      | d. Callicoon        |
|      | c. East Troy       |      | c. Le Raysville   |      | c. Harford           | 212. | Damascus            |
|      | d. Ulster          |      | d. Lawton         |      | d. Thompson          |      | a. Galilee          |
| 152. | Powell             | 172. | Meshoppen         | 192. | Dundaff              |      | b. Damascus         |
|      | a. Leroy           |      | a. Laceyville     |      | a. Lenoxville        |      | c. White Mills      |
|      | b. Powell          |      | b. Auburn Center  |      | b. Clifford          |      | d. Narrowsburg      |
|      | c. Shunk           |      | c. Jenningsville  |      | c. Dalton            | 213. | Hawley              |
|      | d. Overton         |      | d. Meshoppen      |      | d. Carbondale        |      | a. Hawley           |
| 153. | Eagles Mere        | 173. | Harvey Lake       | 193. | Scranton             |      | b. Rowland          |
|      | a. Hillsgrove      |      | a. Dutch Mtn.     |      | a. Scranton          |      | c. Promised Land    |
|      | b. Eagles Mere     |      | b. Noxen          |      | b. Olyphant          |      | d. Pecks Pond       |
|      | c. Picture Rocks   |      | c. Sweet Valley   |      | c. Avoca             | 214. | Bushkill            |
|      | d. Sonestown       |      | d. Harveys Lake   |      | d. Moscow            |      | a. Skytop           |
| 154. | Hughesville        | 174. | Shickshinny       | 194. | Stoddardsville       |      | b. Twelvemile Pond  |
|      | a. Lairdsville     |      | a. Shickshinny    |      | a. Pleasant View     |      | c. East Stroudsburg |
|      | b. Washingtonville |      | b. Nanticoke      |      | Summit               |      | d. Bushkill         |
|      | c. Washingtonville |      | c. Berwick        |      | b. Thornhurst        | 215. | Delaware Water Gap  |
|      | d. Millville       |      | d. Sybertsville   |      | c. Hickory Run       |      | a. Stroudsburg      |
| 155. | Shamokin           | 175. | Mahanoy           | 195. | Mauch Chunk          |      | b. Portland         |
|      | a. Riverside       |      | a. Nuremberg      |      | a. Christmans        |      | c. Bangor           |
|      | b. Danville        |      | b. Conyngham      |      | b. Pohopoco Mountain | 216. | Easton              |
|      | c. Trevorton       |      | c. Shenandoah     |      | c. Leighton          |      | a. Easton           |
|      | d. Shamokin        |      | d. Delano         |      | d. Palmerton         |      | c. Riegelsville     |
| 156. | Lykens             | 176. | Pottsville        | 196. | Alburtis             |      | d. Frenchtown       |
|      | a. Klingerstown    |      | a. Pottsville     |      | a. Slatedale         | 217. | Doylestown          |
|      | b. Valley View     |      | b. Orwigsburg     |      | b. Cementon          |      | a. Bedminster       |
|      | c. Lykens          |      | c. Friedensburg   |      | c. Tipton            |      | b. Lumberville      |
|      | d. Tower City      |      | d. Auburn         |      | d. Allentown West    |      | c. Doylestown       |
| 157. | Hummelstown        | 177. | Wernersville      | 197. | Boyetown             |      | d. Buckingham       |
|      | a. Grantville      |      | a. Strausstown    |      | a. Manatawny         | 218. | Germantown          |
|      | b. Indianatown Gap |      | b. Bernville      |      | b. East Greenville   |      | a. Ambler           |
|      | c. Hershey         |      | c. Womelsdorf     |      | c. Boyertown         |      | b. Hatboro          |
|      | d. Palmyra         |      | d. Sinking Spring |      | d. Sassamansville    |      | c. Germantown       |
| 158. | Middletown         | 178. | New Holland       | 198. | Phoenixville         |      | d. Frankford        |
|      | a. Middletown      |      | a. Ephrata        |      | a. Pottstown         | 219. | Philadelphia        |
|      | b. Elizabethtown   |      | b. Terre Hill     |      | b. Phoenixville      |      | a. Philadelphia     |
|      | c. York Haven      |      | c. Leola          |      | c. Downingtown       |      | b. Camden           |
|      | d. Columbia West   |      | d. New Holland    |      | d. Malvern           |      | c. Woodbury         |

159.	York	179.	Quarryville	199.	West Chester	223.	Milford
	a. York		a. Quarryville		a. Unionville		a. Shohola
	b. Red Lion		b. Gap		b. West Chester		b. Pond Eddy
	c. Glen Rock		c. Wakefield		c. Kennett Square		c. Edgemere
	d. Stewartstown		d. Kirkwood		d. Wilmington North		d. Milford
161.	Towanda	181.	Montrose	201.	Starrucca	224.	Dingmans Ferry
	a. Litchfield		a. Laurel Lake		a. Starrucca		a. Lake Maskenozha
	b. Windham		b. Franklin Forks		b. Hancock		b. Culvers Gap
	c. Towanda		c. Montrose West		c. Orson		c. Flatbrookville
	d. Rome		d. Montrose East		d. Lake Como	227.	Lambertville
162.	Monroeton	182.	Tunkhannock	202.	Honesdale		a. Stockton
	a. Monroeton		a. Springville		a. Forest City		c. Lambertville
	b. Wyalusing		b. Hop Bottom		b. Aldenville		d. Pennington
	c. Dushore		c. Tunkhannock		c. Waymart	228.	Burlington
	d. Colley		d. Factoryville		d. Honesdale		a. Langhorne
163.	Laporte	183.	Pittston	203.	Ariel		b. Trenton West
	a. Laporte		a. Center Moreland		a. Lake Ariel		c. Beverly
	b. Lopez		b. Ransom		b. Lakeville		d. Bristol
	c. Elk Grove		c. Kingston		c. Sterling		
	d. Red Rock		d. Pittston	204.	Pocono		
164.	Bloomsburg	184.	Wilkes-Barre		a. Tobyhanna		
	a. Benton		a. Wilkes-Barre West		b. Buck Hill Falls		
	b. Stillwater		b. Wilkes-Barre East		c. Pocono Pines		
	c. Bloomsburg		c. Freeland		d. Mount Pocono		
	d. Mifflinville		d. White Haven	205.	Wind Gap		
165.	Catawissa	185.	Hazleton		a. Brodheads ville		
	a. Catawissa		a. Hazleton		b. Saylorsburg		
	b. Shumans		b. Weatherly		c. Kunkletown		
	c. Mount Carmel		c. Tamaqua	206.	d. Wind Gap		
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166.	Pine Grove	186.	Hamburg		a. Catsauqua		
	a. Tremont		a. New Ringgold		b. Nazareth		
	b. Minersville		b. New Tripoli	207.	c. Allentown East		
	c. Pine Grove		c. Hamburg		d. Hellertown		
	d. Swatara Hill		d. Kutztown		Quakertown		
167.	Lebanon	187.	Reading		a. Milford Square		
	a. Fredericksburg		a. Temple		b. Quakertown		
	b. Bethel		b. Fleetwood		c. Perkiomenville		
	c. Lebanon		c. Reading	208.	d. Telford		
	d. Richland		d. Birdsboro		Norristown		
168.	Lancaster	188.	Honey Brook		a. Collegeville		
	a. Manheim		a. Morgantown		b. Lansdale		
	b. Lititz		b. Elverson		c. Valley Forge		
	c. Columbia East		c. Honey Brook		d. Norristown		
	d. Lancaster		d. Wagontown				

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Much additional information on Pennsylvania geology is available in publications not covered by this list. The reader is referred to Pennsylvania Geological Survey General Geology Reports 34, 42, and 61 for a complete list of all articles on Pennsylvania geology written before 1969.

### Abbreviations used in this key are as follows:

Pennsylvania 3rd (Commission) Survey—Pa. Geol. Survey (3rd)

Pennsylvania Geological Survey, 4th series—Pa. Geol. Survey (4th)

A	Atlas Series
C	County Reports
EG	Environmental Geology Reports
ES	Educational Series
G	General Geology Reports
IC	Information Circulars
M	Mineral Resource Reports
Map	Map Series
PG	Park Guides
PR	Progress Reports
SB	Special Bulletins
W	Water Resource Reports
WSR	Well Sample Records

United States Geological Survey—U.S. Geol. Survey

B	Bulletins
Cir	Circulars
CI	Coal Investigations Maps
F	Folios
GP	Geophysical Investigations Maps
GQ	Geologic Quadrangle Maps
HA	Hydrologic Investigations Atlases
I	Miscellaneous Investigations Series
MF	Miscellaneous Field Studies Maps
OC	Oil and Gas Investigations Charts
PP	Professional Papers
WS	Water-Supply Papers

United States Bureau of Mines—U.S. Bur. Mines

B	Bulletins
I	Information Circulars
R	Reports of Investigations
TP	Technical Papers

Miscellaneous Publications—Misc.

Pennsylvania Office of Environmental Energy Management—Pa. Off. Environ. Energy Mgt.

A ——— Annual Report on Mining

Pennsylvania Office of Resources Management—Pa. Off. Resources Mgt.

B ——— Water Resources Bulletins



Miscellaneous Publications — *(continued)*

R ——— Report

SWP ——— State Water Plan Bulletins

The Mineralogies of Pennsylvania—Min. Pa.

AM ——— A. Montgomery (1969)

RS ——— R. C. Smith, II (1978)

SG ——— S. G. Gordon (1922; reprinted 1973)

WJ ——— W. W. Jefferis (1854)

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Pa. Geol. Survey (4th): G 12, 33, 43, 65; IC 13, 14, 77; M 3, 5, 11, 13, 14, 18, 50, 63, 72; PG 6; W 2, 14, 25, 49  
 U.S. Geol. Survey: B 359, 725-B, 799, 891, 1082-E, 1082-K; F 211, 223; GP 200, 202, 203, 204, 209, 210, 221, 222, 223, 224, 225, 226, 233, 234, 363, 577; I 514-A, 514-B, 514-C; PP 381, 417-A, 701-A; WS 106  
 U.S. Bur. Mines: I 8248, 8765; R 4451, 4530  
 Misc.: Pa. Off. Resources Mgt.: B 3, 4, 14; SWP 4, 8  
 Min. Pa.: WJ

**CLARION**

Pa. Geol. Survey (4th): A 54; G 40, 67; IC 16, 72; Map 18, 19, 22; M 1, 4, 6, 10, 19, 23, 25, 31, 32, 50(1, 1S, 2B, 4), 51, 66, 68, 69, 74; PR 148; SB 2, 9; W 3, 32  
 U.S. Geol. Survey: B 279, 315 [2], 454; F 115, 125, 178; GP 445, 555; HA 295; I 715, 936; MF 815; PP 580; WS 1835  
 U.S. Bur. Mines: R 5231, 6261, 7174, 7281, 8118  
 Misc.: Pa. Off. Resources Mgt.: SWP 16, 17

**CLEARFIELD**

Pa. Geol. Survey (4th): A 64, 65, 74ab, 74cd, 75, 84cd, 85ab, 85cd, 95a; G 40; IC 16, 61, 72; Map 12, 19, 23, 53, 54, 55; M 2, 4, 5, 6, 10, 23, 31, 39, 50(2B, 3), 51, 55, 66, 68, 69, 74; PR 127, 138, 142; W 5, 45  
 U.S. Geol. Survey: B 285 [1, 4], 531, 659, 1107-D; F 189; HA 295; I 936; PP 263, 580, 750-D; WS 109, 110, 1779-C, 1835  
 U.S. Bur. Mines: B 465; R 4427, 4894, 5166, 6261, 7281, 8118  
 Misc.: Pa. Off. Resources Mgt.: B 14; SWP 9, 17

**CLINTON**

Pa. Geol. Survey (4th): A 124a, 134ab; G 5, 19, 33, 36, 38, 39, 40, 47, 49, 52, 53; IC 3, 16, 60, 72; Map 12, 14, 57; M 1, 3, 4, 6, 10, 23, 31, 34, 35, 36, 39, 50(1, 1S, 2B, 4), 66, 69; PG 11; PR 133, 138, 167, 174; W 5  
 U.S. Geol. Survey: B 225[3]; HA 295, 541; I 936; PP 580; WS 109, 1779-C  
 U.S. Bur. Mines: I 8765; R 4427, 8118  
 Misc.: Pa. Off. Resources Mgt.: B 14; SWP 7, 9, 10, 11

**COLUMBIA**

Pa. Geol. Survey (4th): A 164cd, 174c; G 4, 7, 19, 33, 36, 39, 40, 51, 62, 70; IC 72; M 5, 8, 11, 12, 43, 50(1, 2B, 3, 4), 72; PR 130; W 4  
 U.S. Geol. Survey: B 1107-D, 1271-D, 1317-A; CI 10, 12, 13, 14; GP 669; GQ 918, 919; HA 295; I 936; PP 450-C(72, 73, 74), 580, 700(C); WS 109, 1779-C  
 U.S. Bur. Mines: I 7213, 8409, 8765; R 4743, 8799; TP 659  
 Misc.: Pa. Off. Resources Mgt.: SWP 6, 7, 11

**CRAWFORD**

Pa. Geol. Survey (4th): G 19, 32, 40, 49, 55; IC 16, 62; Map 16, 26, 28, 51, 52; M 1, 6(I), 11, 18(C), 22, 31, 32, 39; PR 148; SB 4; W 3, 33, 46  
U.S. Geol. Survey: HA 295; I 936; PP 580; WS 1835  
U.S. Bur. Mines: R 3385, 5438  
Misc.: Pa. Off. Resources Mgt.: B 14; SWP 15, 16, 20

**CUMBERLAND**

Pa. Geol. Survey (4th): A 127, 129a, 137cd, 138ab, 148ab; EG 4; G 3, 8, 24, 29, 31, 33, 37, 40; IC 68, 70; Map 48; M 3, 11, 18(C), 23, 26, 50(1, 1S, 2B, 4), 51, 63, 72; PG 15; PR 169; W 2, 27, 50  
U.S. Geol. Survey: B 315 [1]; F 225; GP 274, 275, 276, 277, 577, 669; GQ 28; PP 650(B); WS 109, 2054, 2072  
U.S. Bur. Mines: R 4436  
Misc.: Pa. Off. Resources Mgt.: B 14; SWP 8, 14

**DAUPHIN**

Pa. Geol. Survey (4th): A 137ab, 146, 157d; EG 4; G 3, 4, 7, 8, 12, 13, 19, 29, 31, 37, 40, 43, 44, 51, 70; IC 68, 72, 77; Map 48; M 3, 8, 50, 51, 63, 78; PR 130; W 2, 4, 24, 49  
U.S. Geol. Survey: B 359, 840, 1107-D, 1271-D; GP 267, 268, 269, 275, 577, 669; GQ 698, 700, 701; HA 57; I 529; PP 263, 450-C(72, 73, 74), 800-D; WS 109, 1539-H, 1779-B, 1798-M, 1829  
U.S. Bur. Mines: I 7213, 8409, 8765  
Misc.: Pa. Off. Resources Mgt.: SWP 4, 7, 8

**DELAWARE**

Pa. Geol. Survey (4th): G 12, 33, 65; IC 13, 14, 70, 77; M 5, 10, 13, 27, 50(3); W 2, 13, 25  
U.S. Geol. Survey: F 162, 223; GP 200, 201, 203, 204, 363, 577; I 514-A, 514-B, 514-C; PP 381, 417-A, 1067-D; WS 106  
U.S. Bur. Mines: I 8765  
Misc.: Pa. Off. Resources Mgt.: SWP 4

**ELK**

Pa. Geol. Survey (4th): A 74ab; G 40; IC 16, 72; Map 17, 19, 46, 53; M 1, 4, 6, 10, 11, 18(C), 19, 23, 31, 32, 36, 39, 40, 50(1, 4), 66, 69, 74; PR 110, 138, 142, 148; W 6, 45  
U.S. Geol. Survey: HA 295; I 936; PP 193-C, 263, 580; WS 109, 1835  
U.S. Bur. Mines: R 6261, 6917, 7281  
Misc.: Pa. Off. Resources Mgt.: B 14; SWP 9, 16, 17

**ERIE**

Pa. Geol. Survey (4th): G 19, 32, 40, 49, 55, 64; IC 16, 56, 62, 79; Map 16, 50, 51, 52; M 1, 11, 18(C), 23, 31, 39, 40, 51, 60; PR 127; W 3  
U.S. Geol. Survey: Cir 174; HA 295; I 936; MF 1102; PP 193-C, 580; WS 1835  
Misc.: Pa. Off. Resources Mgt.: SWP 15, 16

**FAYETTE**

Pa. Geol. Survey (4th): A 48; C 26; G 3, 19, 40, 56A, 67; IC 16, 70, 72, 84; Map 24, 25, 32, 34; M 1, 2, 4, 5, 6, 10, 11, 17, 18(B), 19, 31, 39, 50, 51, 66, 68, 69, 74, 77; PG 7; PR 124, 126; W 1  
U.S. Geol. Survey: B 1363; F 82, 94, 160; GP 445, 555; GQ 648, 743; HA 295; I 588, 743, 936; MF 529, 815; PP 580, 600-C, 650(C)  
U.S. Bur. Mines: R 4807, 4815, 7131, 7281, 8226r  
Misc.: Pa. Off. Resources Mgt.: SWP 19



**FOREST**

Pa. Geol. Survey (4th): G 7, 40; IC 16; Map 4, 16, 17, 18, 19; M 1, 4, 6(I), 18(C), 19, 22, 25, 31, 32, 38, 40, 57; PR 118, 148; W 3  
U.S. Geol. Survey: HA 295; I 936; PP 263, 580; WS 1835  
Misc.: Pa. Off. Resources Mgt.: SWP 16, 17

**FRANKLIN**

Pa. Geol. Survey (4th): A 109a, 119ab, 119cd, 129a, 129c; G 3, 19, 24, 37, 38, 40, 58; IC 70; M 3, 11, 18(C), 27, 50(1, 1S, 3), 51, 63; PG 15; PR 179, 180; W 2, 53  
U.S. Geol. Survey: F 170, 179, 225; I 936; WS 109, 110  
Misc.: Pa. Off. Resources Mgt.: SWP 8, 13, 14

**FULTON**

Pa. Geol. Survey (4th): A 109a; G 19, 24, 33, 38, 39, 40, 48; IC 17, 70, 72; Map 40; M 3, 6(I), 18(C), 23, 50(1, 3, 4), 51; W 5  
U.S. Geol. Survey: B 1107-D; F 170, 179; HA 295; I 936; PP 580; WS 109, 110  
Misc.: Pa. Off. Resources Mgt.: B 14; SWP 12, 13, 14

**GREENE**

Pa. Geol. Survey (4th): C 30; G 7, 40; IC 16, 67, 72, 75, 84; Map 25, 31, 32; M 1, 2, 4, 6, 17, 19, 31, 32, 50(2B), 54, 66, 68, 69, 74, 76, 77; PR 148  
U.S. Geol. Survey: B 225[4], 285[3], 304, 318; F 82, 121, 146; GP 445, 555; GQ 826, 838, 1003; HA 295; I 588, 663, 699, 743, 936; MF 529, 815; PP 580, 600-C, 621, 800-D; WS 110  
U.S. Bur. Mines: I 8765; R 5143, 5434, 7131, 7281, 7827, 7910, 8118, 8217, 8231, 8286, 8380, 8640  
Misc.: Pa. Off. Resources Mgt.: B 14; SWP 19, 20

**HUNTINGDON**

Pa. Geol. Survey (4th): A 96; G 3, 12, 19, 33, 36, 38, 39, 40, 48, 52, 53, 58; IC 72; Map 55; M 3, 4, 5, 6, 10, 18(B), 23, 27, 50, 51, 66, 72; PG 1; PR 176; W 5  
U.S. Geol. Survey: B 508, 1107-D; F 227; HA 295; PP 150-E, 580, 800-B; WS 109, 1779-C  
U.S. Bur. Mines: R 4326, 7281  
Misc.: Pa. Off. Resources Mgt.: B 14; SWP 12, 13, 14

**INDIANA**

Pa. Geol. Survey (4th): A 55, 57, 65; G 3, 12, 33, 39, 40, 67; IC 16, 72, 84; Map 22, 23, 24, 33; M 1, 2, 4, 6, 10, 17, 19, 31, 39, 50(1, 2B, 3, 4), 66, 69, 74, 77; PR 126; W 3  
U.S. Geol. Survey: B 225[2], 256, 285[2, 4], 447, 531, 659; F 102, 110, 123, 174, 189; GP 445, 555; HA 295; I 936; MF 815; PP 580, 1211; WS 109, 110, 1835  
U.S. Bur. Mines: I 8765; R 4757, 4763, 5314, 7281, 8118, 8406  
Misc.: Pa. Off. Resources Mgt.: B 14; SWP 9, 17, 18

**JEFFERSON**

Pa. Geol. Survey (4th): A 54, 55, 64, 65, 74ab; G 33, 39, 40; IC 16, 72; Map 19, 23; M 1, 2, 4, 6, 10, 11, 19, 23, 31, 32, 39, 50(1, 2B, 4), 51, 59, 66, 69, 72, 74; PR 127; W 3, 45  
U.S. Geol. Survey: B 285[2, 4], 531; GP 445, 555; HA 295; I 936; MF 815; PP 263, 580; WS 1835  
U.S. Bur. Mines: R 4840, 4941, 7281, 8118  
Misc.: Pa. Off. Resources Mgt.: SWP 9, 17

**JUNIATA**

Pa. Geol. Survey (4th): A 126, 127, 136, 146; G 12, 19, 29, 33, 36, 39, 40, 48, 51, 70; IC 64; M 3, 18(C), 23, 39, 50(1, 1S, 4), 51; W 5, 27  
U.S. Geol. Survey: GP 669; HA 295; I 936; PP 580; WS 109, 1779-C  
Misc.: Pa. Off. Resources Mgt.: SWP 7, 13

**LACKAWANNA**

Pa. Geol. Survey (4th): G 7, 9, 19, 39, 40, 63; IC 16, 65, 72, 77; M 5, 8, 43, 50(3); PG 3; PR 130, 138; W 4, 41  
U.S. Geol. Survey: B 1213, 1317-A; GP 669; HA 295; I 936; PP 193-D, 381, 473-B, 580; WS 109  
U.S. Bur. Mines: B 494, 545; I 8409, 8453; R 6988, 7086; TP 659  
Misc.: Pa. Off. Resources Mgt.: B 14; SWP 2, 3, 5, 6

**LANCASTER**

Pa. Geol. Survey (4th): A 167d, 168, 177c, 177d, 178; G 3, 7, 12, 33, 40, 43, 46, 65; IC 14, 68, 70, 76; M 3, 5, 11, 16, 23, 50, 51, 63, 72; PR 153; W 2, 26, 43, 49  
U.S. Geol. Survey: B 359, 725-B, 799, 840, 891, 1254-G, 1314-C, 1457-A; F 223; GP 217, 218, 219, 220, 233, 234, 239, 240, 241, 242, 243, 244, 245, 255, 256, 257, 258, 259, 269, 577; I 514-A, 514-B, 514-C; PP 700(B); WS 109  
U.S. Bur. Mines: B 513; I 7213; R 4247, 4383  
Misc.: Pa. Off. Resources Mgt.: SWP 4, 8

**LAWRENCE**

Pa. Geol. Survey (4th): A 5; G 7, 32, 40, 55, 67; IC 16, 72; Map 21, 26, 28, 29; M 1, 2, 4, 6, 17, 31, 32, 50(1, 1S, 2B, 4), 51, 66, 69, 74, 77; PG 9; PR 127; W 3, 15, 16  
U.S. Geol. Survey: B 873, 1143-B; GP 445, 555; HA 295; I 936; MF 815; PP 580  
U.S. Bur. Mines: R 7281, 7324, 8118  
Misc.: Pa. Off. Resources Mgt.: SWP 20

**LEBANON**

Pa. Geol. Survey (4th): A 157d, 167c, 167d, 168, 177c; G 3, 19, 31, 33, 35, 37, 39, 40, 43, 51; IC 68, 70, 72, 77; M 3, 5, 8, 11, 16, 18(B), 50(1, 1S, 3, 4), 51, 56, 63; PG 16; PR 130, 140; W 2, 4, 18, 26, 49, 55  
U.S. Geol. Survey: B 359, 840, 1254-G, 1271-D; GP 239, 254, 255, 256, 268, 269, 577, 669; GQ 691, 698; I 529; PP 450-C(72, 73, 74), 800-D; WS 109, 1829  
U.S. Bur. Mines: I 8409  
Misc.: Pa. Off. Resources Mgt.: B 3, 14; SWP 4, 8

**LEHIGH**

Pa. Geol. Survey (4th): A 195cd, 197, 206; C 39; G 7, 16, 31, 33, 37, 40, 43, 45; IC 77; Map 39; M 3, 5, 11, 16, 27, 50(1, 1S, 3), 51, 63, 72; W 2, 30, 31  
U.S. Geol. Survey: B 828; GP 205, 206, 213, 266, 577, 669; PP 381, 400-B(79), 744, 1023; WS 1879-H  
U.S. Bur. Mines: R 4180  
Misc.: Pa. Off. Resources Mgt.: B 3; SWP 3, 4

**LUZERNE**

Pa. Geol. Survey (4th): A 174c, 194cd; G 9, 19, 26, 39, 40, 51, 63, 71; IC 16, 65, 72; Map 60; M 2, 8, 10, 12, 39, 50(2B, 3), 51, 78; PG 13; PR 130; W 4, 28, 40  
U.S. Geol. Survey: B 1107-D, 1213, 1317-A; GP 669; HA 295, 523; I 753, 838, 936; PP 193-D, 381, 473-B, 580, 700(C); WS 109, 1879-H  
U.S. Bur. Mines: B 491, 494, 513, 545; I 7213, 8379, 8409; R 6989, 7086, 7281, 7364; TP 659  
Misc.: Pa. Off. Resources Mgt.: B 14; SWP 3, 5, 6

**LYCOMING**

Pa. Geol. Survey (4th): A 124a, 133cd, 134ab, 143cd, 144ab; G 2, 3, 7, 19, 33, 39, 40, 49, 53, 71; IC 16, 72; Map 14, 47, 60; M 2, 3, 5, 6(II, III, IV), 11, 23, 27, 35, 39, 43, 45, 50(1, 1S, 3, 4), 51, 66, 72, 74, 80; PR 138, 164, 167, 174; W 6, 51  
U.S. Geol. Survey: B 1107-D; GP 669; HA 295; I 936; MF 684; PP 379, 580; WS 109, 1779-C  
Misc.: Pa. Off. Resources Mgt.: B 14; SWP 10, 11

**McKEAN**

Pa. Geol. Survey (4th): G 19, 40, 71; IC 16, 72; Map 5, 17, 36, 46; M 1, 6(I, III, IV), 11, 18(C), 19, 21, 23, 31, 32, 39, 40, 50(2B), 62, 66; PR 111, 125, 131, 138, 148, 178; SB 5, 6; W 6  
 U.S. Geol. Survey: HA 295; I 936; PP 193-C, 580; WS 1835  
 U.S. Bur. Mines: R 3385, 4842, 5438, 6943  
 Misc.: Pa. Off. Resources Mgt.: SWP 9, 16, 17

**MERCER**

Pa. Geol. Survey (4th): G 32, 40, 49, 55, 67; IC 16, 62, 72; Map 26, 28; M 1, 2, 4, 6, 11, 31, 32, 39, 50(4), 66, 69, 74; PR 127, 148, 178; W 3, 15, 16, 33  
 U.S. Geol. Survey: GP 445, 555; HA 295; I 936; MF 815; PP 580; WS 1835  
 U.S. Bur. Mines: R 7281, 8118  
 Misc.: Pa. Off. Resources Mgt.: B 14; SWP 16, 20

**MIFFLIN**

Pa. Geol. Survey (4th): A 126; G 3, 12, 19, 29, 36, 38, 39, 40, 48, 52, 53, 58; Map 55; M 3, 11, 18(B), 50(1S, 4); W 5, 27  
 U.S. Geol. Survey: HA 295; PP 580; WS 109, 1779-C  
 Misc.: Pa. Off. Resources Mgt.: B 14; SWP 7, 13

**MONROE**

Pa. Geol. Survey (4th): A 194cd, 204ab, 204cd, 214a, 214c; G 3, 4, 10, 11, 19, 39, 40, 51, 57, 60, 71; IC 65, 70; M 3, 5, 23, 50(1, 1S, 3), 51, 63; W 4, 47  
 U.S. Geol. Survey: B 508, 1243, 1244-H, 1317-A; GP 669; GQ 908, 1047; HA 295; MF 578-A; PP 381, 580, 650(D), 744  
 Misc.: Pa. Off. Resources Mgt.: B 14; SWP 2, 3

**MONTGOMERY**

Pa. Geol. Survey (4th): A 197; G 3, 12, 33, 43, 65; IC 70, 77; M 3, 5, 13, 50, 51, 63, 72; PG 8; PR 146; W 2, 14, 22, 29  
 U.S. Geol. Survey: B 359, 828, 891; GP 200, 201, 205, 206, 207, 208, 209, 210, 222, 232, 237, 262, 263, 264, 265, 577; HA 248; I 514-A, 514-B, 514-C  
 U.S. Bur. Mines: R 4666  
 Misc.: Pa. Off. Resources Mgt.: B 2, 3, 4; SWP 4

**MONTOUR**

Pa. Geol. Survey (4th): A 144ab; G 3, 7, 19, 40; IC 60; M 11, 50(1, 1S, 3, 4); W 4  
 U.S. Geol. Survey: B 1107-D; GP 669; HA 295; PP 580; WS 109, 1779-C  
 Misc.: Pa. Off. Resources Mgt.: SWP 6, 11

**NORTHAMPTON**

Pa. Geol. Survey (4th): A 195ab, 195cd, 206; C 48; G 7, 10, 11, 16, 31, 33, 37, 39, 40, 45, 57, 70; IC 70, 77; M 3, 5, 9, 16, 23, 50(1, 1S, 3), 51, 63, 64, 72; W 2, 30  
 U.S. Geol. Survey: B 920, 1107-D, 1194-L, 1244-H; GP 213, 235, 236, 549, 550, 551, 562, 568, 569, 570, 571, 577; GQ 593, 594, 665, 1047; HA 246; I 552; MF 578-A; PP 381, 400-B(79), 744, 1023; WS 1879-H  
 U.S. Bur. Mines: I 7213, 8765  
 Misc.: Pa. Off. Resources Mgt.: SWP 2, 3

**NORTHUMBERLAND**

Pa. Geol. Survey (4th): A 144ab, 146; G 3, 4, 7, 13, 19, 23, 39, 40, 51, 71; IC 16, 72; M 5, 8, 11, 12, 23, 39, 43, 50, 51, 72, 78; PR 130; W 4  
 U.S. Geol. Survey: B 995-A, 1271-D; CI 3, 7, 10, 12, 46, 47, 48; GP 669; GQ 692, 699, 700, 919; HA 295; I 734, 936; PP 450-C(72, 73, 74), 580, 700(C); WS 109, 1779-C  
 U.S. Bur. Mines: I 7213, 8409; R 7281; TP 659  
 Misc.: Pa. Off. Resources Mgt.: SWP 6, 7, 11

**PERRY**

Pa. Geol. Survey (4th): A 126, 127, 136, 137ab, 137cd, 146; G 3, 4, 8, 12, 19, 29, 30, 33, 36, 39, 40, 48, 51, 62, 70; IC 68; M 3, 50(1S, 3, 4), 51; W 5, 27  
U.S. Geol. Survey: B 508; HA 295; GP 669; PP 580, 1067-D; WS 109  
U.S. Bur. Mines: I 7213  
Misc.: Pa. Off. Resources Mgt.: B 14; SWP 7, 8, 13

**PHILADELPHIA**

Pa. Geol. Survey (4th): G 12, 41, 43, 65; IC 70; M 5, 27, 50(3); W 2, 13  
U.S. Geol. Survey: F 162; GP 577; HA 248; I 514-A, 514-B, 514-C; PP 381, 1067-D; WS 106  
Misc.: Pa. Off. Resources Mgt.: B 3, 4; SWP 4

**PIKE**

Pa. Geol. Survey (4th): A 204ab, 214a, 223; G 4, 19, 39, 40, 51, 60, 63; IC 16, 65; M 5, 23, 50(3), 51; W 4  
U.S. Geol. Survey: B 1243, 1317-A; GQ 908; HA 295; I 936; PP 381, 580  
Misc.: Pa. Off. Resources Mgt.: B 14, SWP 2

**POTTER**

Pa. Geol. Survey (4th): G 4, 19, 40, 71; IC 16; Map 14, 36, 47; M 1, 6(I), 18(C), 19, 23, 30, 31, 32, 36, 39, 40; PR 106, 117, 138, 148, 167; W 6  
U.S. Geol. Survey: F 92; HA 295; I 936; PP 288, 580; WS 109, 1779-C, 1835  
U.S. Bur. Mines: I 8765  
Misc.: Pa. Off. Resources Mgt.: B 14; SWP 5, 9, 10, 16

**SCHUYLKILL**

Pa. Geol. Survey (4th): G 14, 19, 39, 40, 51, 62; IC 72; M 3, 5, 8, 12, 50, 51, 63, 64, 78; PG 16; PR 130; W 4, 18  
U.S. Geol. Survey: B 508, 1107-D, 1112-F, 1271-D; CI 12, 13, 14, 19, 21, 25, 43; GP 669; GQ 689, 690, 691, 692, 698, 699, 700, 701, 781, 918, 919, 1028, 1029, 1054, 1132, 1133; HA 295; I 528, 529, 681, 689, 737, 809; PP 263, 381, 450-C(72, 73, 74), 580, 700(C); WS 109, 1829  
U.S. Bur. Mines: B 491, 513; I 8409; R 7281; TP 659  
Misc.: Pa. Off. Resources Mgt.: B 3, 14; SWP 4, 6, 7, 8

**SNYDER**

Pa. Geol. Survey (4th): A 126, 136, 146; G 3, 19, 33, 36, 39, 40, 48, 51, 62, 70; IC 16; M 3, 18(B), 50(1, 1S, 4); W 5, 27  
U.S. Geol. Survey: B 508; GP 669; HA 295; I 936; PP 580; WS 109, 1779-C  
U.S. Bur. Mines: I 7213  
Misc.: Pa. Off. Resources Mgt.: SWP 7, 13

**SOMERSET**

Pa. Geol. Survey (4th): A 48, 57; C 56A; G 19, 24, 39, 40, 67; IC 16, 72; Map 24, 33, 34, 35, 37; M 4, 6, 10, 23, 31, 39, 59(1, 1S, 2B), 51, 66, 68, 69, 74, 77; W 5  
U.S. Geol. Survey: B 447, 1363; F 160, 174, 224; GP 445, 555; HA 295; I 936; MF 815; PP 580; WS 109, 1835  
U.S. Bur. Mines: I 8765; R 4834, 4998, 5269, 7281, 8118, 8575  
Misc.: Pa. Off. Resources Mgt.: B 14; SWP 12, 14, 18, 19

**SULLIVAN**

Pa. Geol. Survey (4th): G 7, 19, 33, 39, 40, 71; IC 16, 66, 72; Map 60; M 2, 5, 27, 39, 43, 50(3), 66, 72, 80; PG 12; PR 130, 138; W 6  
U.S. Geol. Survey: B 1107-D, 1317-A; GP 669; HA 295; I 936; PP 379, 580; WS 109, 1779-C  
U.S. Bur. Mines: TP 659  
Misc.: Pa. Off. Resources Mgt.: SWP 5, 6, 11



**SUSQUEHANNA**

Pa. Geol. Survey (4th): G 4, 19, 39, 40, 63; IC 16, 65, 66, 72; M 18(C), 27, 51; PR 130, 138; W 4  
 U.S. Geol. Survey: B 1317-A; GP 669; HA 295; I 936; PP 193-D, 580; WS 109  
 U.S. Bur. Mines: I 8409, 8453, 8765  
 Misc.: Pa. Off. Resources Mgt.: SWP 5, 6

**TIOGA**

Pa. Geol. Survey (4th): G 4, 19, 39, 40, 71; IC 16, 66, 72; Map 14, 47, 58; M 1, 2, 4, 6, 18(C), 27, 31, 32, 39, 40, 66, 74; PG 5; PR 107, 117, 138, 148, 164; W 6  
 U.S. Geol. Survey: F 92, 93; HA 295; I 936; PP 379, 580; WS 109, 1532-C, 1532-E, 1779-C  
 U.S. Bur. Mines: R 8118  
 Misc.: Pa. Off. Resources Mgt.: B 14; SWP 5, 10, 11

**UNION**

Pa. Geol. Survey (4th): A 144ab; G 3, 19, 33, 36, 40, 49; IC 16; M 5, 18(B), 39, 50(2B, 3, 4), 51, 72; W 5  
 U.S. Geol. Survey: GP 669; HA 295; I 936; PP 580; WS 109, 1779-C  
 Misc.: Pa. Off. Resources Mgt.: B 14; SWP 7, 11

**VENANGO**

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Pa. Geol. Survey (4th): A 96, 144ab, 168, 187ab, 206; C 9, 26, 39; G 33; M 5, 50(3), 72  
U.S. Geol. Survey: B 855, 891, 920, 1314-C  
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